other words, our customers call Comcast first whenever their DOCSIS device is not working properly, even if they purchased that device at a retail store. Accordingly, as an operational matter, ensuring that the devices attached to our network are high quality and conform to the way our customers expect to be able to use them makes it easier for Comcast to deliver a superior service and makes it less costly to provide that service by reducing the number of service calls, repair visits, and so forth.

7. To this end, we require any manufacturer that seeks to have Comcast certify its device for use with the Comcast HSI service meet Comcast's testing and certification requirements. We have found that it is imperative to engage in this type of testing. As a competitive matter, it is critical that our customers have a positive experience with the service we sell them, and the DOCSIS device is a key component of the quality of the service they receive. Inferior devices generally will not provide the performance and reliability that our service delivers and customers rightfully expect.

8. Today, Comcast employs two testing procedures that all DOCSIS devices -- those that will be purchased by our customers at retail, as well as those purchased by us for lease or resale -- must satisfy before they are certified to work on Comcast's network: DOCSIS testing and physical and environmental ("P&E") testing. In my current position at Comcast, I oversee the DOCSIS testing of all DOCSIS devices used on the Comcast network. My statements in this document will focus on that aspect of our testing and certification program.

II. The Need for DOCSIS Testing

9. Upon information and belief, all operators of DOCSIS-enabled networks perform some form of DOCSIS testing of the devices that their customers use to access

their broadband Internet services. CableLabs' testing ensures that a device conforms with the DOCSIS specification, but the DOCSIS specification permits multiple implementations. Different vendors use different implementations of the DOCSIS specification, and they do not always work together. Before placing a piece of equipment from a particular vendor in its network, an operator needs to be sure that the equipment functions properly in an environment with equipment from multiple vendors.

10. Moreover, each piece of vendor equipment allows for multiple configurations, thereby enabling each operator to set its own, network-specific characteristics and performance requirements. Operators' DOCSIS testing programs generally ensure that the devices used on their various broadband Internet networks conform to the specific engineering approaches and work with the various vendors, equipment, equipment configurations, and other characteristics that are specific to their networks and their customers' experiences.

11. Comcast's DOCSIS testing and certification program ensures that DOCSIS devices are able to successfully connect to and work with Comcast's network equipment, such as the Cable Modem Termination System ("CMTS"), and back office systems, and provide the service, quality, and performance purchased and expected by Comcast's customers. These tests are performed on a wide variety of DOCSIS devices, including DOCSIS modems, embedded multimedia terminal adapters ("eMTAs") and embedded digital voice adapters ("eDVAs") (devices that combine digital voice services with DOCSIS modem capabilities), and test equipment used by Comcast Operations personnel.

III. Comcast's DOCSIS Testing Is Needed To Ensure That Comcast's Customers Are Using Devices That Perform Properly.

12. In light of Comcast's experience operating a broadband Internet network and service, Comcast has established DOCSIS testing requirements with the goal of ensuring that the DOCSIS devices attached to Comcast's broadband Internet network function properly and perform at the high standards that our customers expect. Simply put, unless a device goes through our DOCSIS testing, there is no way to be sure that it will work when the customer attaches it to our network.

13. Comcast's DOCSIS testing is not an obstacle for vendors of DOCSIS devices. To the contrary, my experience is that vendors appreciate how our testing helps them to develop superior products by identifying and correcting issues before customers put their devices into service.

14. Comcast's DOCSIS testing can be divided up into ten different component parts. Each part, in its own way, plays an integral role in ensuring that a DOCSIS device functions properly and enables a customer to access the proper level of service and performance. Highlighted below are some of the tests we perform:

15. *Provisioning.* These tests ensure that the appropriate information -- contained in "bootfiles" -- can be loaded on to and interpreted by the customer's device. These bootfiles provide the device with the necessary information for the device to operate on the network. If Comcast does not perform these tests, there is no assurance that the device will receive the necessary bootfile when it connects to our network, or that it will correctly interpret the information contained in the bootfile. A DOCSIS device that cannot receive or correctly interpret the bootfile will not function.

16. *Secure Software Download.* These tests ensure that new firmware upgrades can be securely and successfully delivered to the device. These firmware downloads are a cost-effective way to deploy maintenance updates and upgrades that will allow a customer to automatically receive better service quality and higher speeds as we increase the speeds on a given service tier.

17. A device that is incapable of successfully downloading firmware upgrades or updates will mean, at best, costly service calls to (1) diagnose the problem and (2) if necessary, physically update the device. At worst, a customer will have a device that has any number of known defects or bugs. Moreover, if the device cannot download upgrades or updates, a customer may be unable to take advantage of new services that Comcast will offer.

18. *Performance.* Devices deployed on the Comcast HSI network are expected to provide certain levels of performance depending on the version of the DOCSIS specification that they support (e.g., DOCSIS 2.0 versus DOCSIS 3.0). The "performance" tests measure the maximum upstream and downstream speeds that can be achieved with a particular device. As described in the CableLabs DOCSIS Certification Guidelines, CableLabs does not test performance, quality, or other subjective characteristics of the device. If Comcast does not perform these tests, we cannot ensure that the customer will be able to receive the performance and speed tiers that she has purchased. Particularly as we transition most of our network to DOCSIS 3.0, and raise available speeds across our entire footprint for each tier, this testing is a critical component of ensuring that we can provide the service that our customers expect.

19. *IPv6.* The Internet is running out of "addresses" that are available under Internet Protocol Version 4 ("IPv4"). The next generation of Internet Protocol -- known as IPv6 -- provides many more new addresses to handle the growth of Internet-capable devices. The IPv6 tests ensure that IPv6-capable devices are able to properly operate on the Comcast network in IPv6 mode, and more importantly, that such devices are capable of operating in conjunction with equipment that is not yet IPv6 capable. These interoperability tests will ensure proper device and network operation as well as quality of service and appropriate levels of performance.

20. These tests would not be applicable to any devices that are not IPv6 capable. However, because Comcast is a leader in the transition to IPv6, we are working with our vendors to have them develop more IPv6-capable devices and we are encouraging them to work towards that goal so that an adequate amount of IP addresses are available to customers.

21. *Stability Tests.* These tests ensure that a device is able to properly recover from various events, such as a "soft" reboot (i.e., resetting the device without a power cycle), that can occur in the course of network operations. These events typically require a device to reestablish a connection with the network in order to regain service. This function happens automatically between a device and the network. If registration is not performed successfully or in a reasonable amount of time, then a customer may not regain service. Devices must reestablish a connection with the network within five minutes of such an event in order to ensure that customers are not without service for prolonged periods.

22. *Dynamic Channel Change.* These tests ensure that a DOCSIS device can properly perform dynamic channel changes. "Dynamic Channel Change" refers to the mechanism the broadband Internet network uses to command a DOCSIS device to "move" from one downstream and/or upstream frequency to another. This is done in order to properly balance traffic load across the available capacity. This also supports a cost-effective method for purchasing only the network equipment that is needed to provide proper and cost-effective bandwidth utilization in the network, ensuring correct capacity and performance to the customers.

23. If Comcast does not perform these tests, we cannot be certain that a device will properly process channel change directions. If a device does not process the channel change request properly, customers could experience either a temporary service interruption or a more severe service outage.

24. *Operation Systems Support (OSS) / Embedded Host (eHOST) OSS.* These tests ensure that a device replies properly when queried for operational information by the network. These responses are used to determine the "real time" status and condition of the device. Comcast also uses these queries to verify that a customer is using a Comcast-certified device for "Customer Home Self Install," also known as "Self Provisioning."

25. If Comcast does not perform these tests, then incorrect status information may be gathered from a device and present an inaccurate picture of service quality and performance to the Comcast staff monitoring the state of the network. If Customer Home Self Install does not work properly, an expensive service call will be required in addition to incurring a delay in service availability for the customer.

26. *Radio Frequency (RF) Capability.* These tests ensure that a device complies with the appropriate DOCSIS-level radio frequency ("RF") capability as described in the DOCSIS specification and as implemented on Comcast's network. The DOCSIS specification gives each network operator some flexibility to choose which frequencies to use to transmit data. Moreover, with the introduction of new DOCSIS versions, the specification amended the frequency range of downstream channels. Also, the DOCSIS specification does not describe the downstream and upstream search algorithms (i.e., it does not tell DOCSIS devices how to search for the proper frequencies).

27. Comcast must perform these tests to verify that a device can select the proper frequencies, and to ensure a consistent and predictable registration behavior in response to negative RF events (i.e., the loss, corruption, or impairment of the RF signal), thereby ensuring service availability and appropriate device performance. If Comcast does not perform these tests, even the mere installation of a particular device could be problematic, as the installer of the device, regardless of whether it is the customer or a Comcast technician, may not interpret the reason why the device has such a long registration time. This may cause the installer to contact the Customer Service Center for assistance, creating even more delays and adding more costs for both Comcast and the customer.

IV. CableLabs Testing Is a Necessary, but Not Sufficient, Step for Ensuring That DOCSIS Devices Work Properly When Deployed to the Field.

28. CableLabs' testing focuses on whether the device has successfully implemented the DOCSIS specification. However, by no means does the CableLabs

testing ensure that a device will function properly on any particular network. Each broadband ISP uses different equipment, and different configurations on that equipment. Different vendors have different implementations of the DOCSIS standard, and it is no guarantee that equipment from one vendor will work with equipment from another simply because they have both implemented the DOCSIS specification.

29. As a result, CableLabs' testing is designed to be as generic as possible and focuses on conformance to the DOCSIS specification. Comcast's DOCSIS testing, on the other hand, is designed to replicate the equipment, configurations, and usage that a device would have to work with on the Comcast network.

30. As described above, the DOCSIS testing that Comcast employs is designed to supplement -- and complement -- the DOCSIS testing performed by CableLabs in a number of important ways. Most notably, while CableLabs' testing ensures some of the basic functionality of a device against a generic set of circumstances and in a laboratory environment, Comcast tests devices against the specific set of equipment, configurations, and other characteristics of the Comcast HSI network.

31. Comcast's DOCSIS tests are run against every CMTS model and production version of software that is deployed in the Comcast network. Comcast has deployed CMTSes from three different manufacturers -- Cisco, Arris, and Motorola -- and each CMTS model may have one or more software versions operating in the network. The DOCSIS testing ensures proper network operation and delivery of service to our customers. Previous test results have shown numerous examples where a device fails a particular DOCSIS test only for specific CMTS models and/or software versions.

If deployed, such devices could create numerous performance problems, and service quality to Comcast's customers would be negatively impacted.

32. In addition, Comcast DOCSIS tests are also run under the "real world" conditions that reflect the typical conditions under which our customers use Comcast's HSI service. For example, Comcast's tests are repeated without performing a power cycle of the device. CableLabs, on the other hand, performs a power cycle of the device being tested at the beginning of each test. CableLabs' approach does not sufficiently replicate real-world conditions, as customers do not power cycle these device this frequently. Comcast's approach enables us to uncover problems that may build up over time and might be masked by frequent power cycles. For example, a memory leak (i.e., the slow depletion over time of the memory resources that the device requires for proper operation) is the type of problem that would be masked by frequent power cycles. If a memory leak is not identified in testing prior to deployment in the field, it could cause the modem to hang or go offline, eliminating service for the customer.

33. Another critical difference is that CableLabs does not conduct any performance testing, as I mentioned above. Comcast's DOCSIS testing ensures that a device attached to Comcast's network can actually provide the speeds for the tier that the customer has ordered.

34. Comcast's DOCSIS testing includes tests designed to discover issues that CableLabs' testing program would not have discovered.

35. One example of this is the set of Stability Tests performed as part of Comcast's DOCSIS testing program. In the past, these tests have uncovered defects in certain devices that caused the device to take up to 15 minutes to register with the

network every time it reset (whether on its own or manually by the user). This is a significant service quality issue. Waiting even a few minutes for the device to register with the network could be a significant issue for many customers, particularly if the customer is trying to make an emergency phone call via a Voice-over-Internet-Protocol ("VoIP") service, such as provided by Vonage.

36. Another example is referred to as the "T4 Cutoff" test. T4 is a DOCSIS specification timeout setting. If the device loses its RF signal, it commences a 30 second countdown. Upon expiration, the device must reset itself and register with the CMTS.

37. Comcast initially did not test to ensure proper reset. However, Comcast's customers and service personnel reported a recurring problem with a particular DOCSIS device that had passed both CableLabs' testing and the DOCSIS testing Comcast had in place at the time. The problem was that a particular vendor had a DOCSIS firmware registration procedure defect built into its device. This defect would cause a major failure after a number of iterations of this condition, resulting in the customer *completely* losing service.

38. When Comcast investigated the problem, we discovered that it was an issue that our testing did not account for. We subsequently included a test in our testing plan that is designed to ensure that DOCSIS devices will not fail because of this problem.

39. Another critical issue that CableLabs' testing simply cannot capture is with respect to bidirectional testing. For example, with respect to one particular vendor's chipset, [[

]] This is clearly a significant customer service issue. We do not want to place devices into circulation that will make it more difficult for our customers to achieve the speeds that they have purchased.

V. Comcast's Testing Processes Are Designed To Ensure That Devices Are Properly Tested as Quickly and Efficiently as Possible.

40. In its Complaint, Zoom makes several statements about the DOCSIS testing process that are either misleading or completely incorrect. In the following paragraphs, I would like to describe for you the Comcast DOCSIS testing process.

41. Like CableLabs, Comcast performs its DOCSIS testing in "waves." We will typically have one or two "waves" each month, though the exact number of waves in any given month likely will depend on a number of factors, including the number of devices being tested.

42. Over the past year, Comcast has taken significant steps to improve and expedite its testing program. For example, earlier this year, Comcast transitioned DOCSIS certification testing from the Access Network Engineering team to the Quality

Assurance team, which has more staff and resources to dedicate to testing (both teams fall within the Network Engineering & Technical Operations group).

43. As part of that transition, Comcast substantially expanded its testing facilities to give our testing groups greater capacity and flexibility. Specifically, [[

]] With its old test facilities, Comcast was limited in how it could schedule test waves, and did so based on the monthly calendar so that, if a device came in mid-month, it would have to wait until the next month to be tested, assuming that the schedule for that month was not already full. With the expansion of Comcast's DOCSIS test facilities, the additional test beds give us more flexibility to schedule different certification waves at the same time, i.e., to start one wave of testing while a previous wave is still ongoing. The additional capacity allows us to test more devices at any one time.

44. Zoom's contention that Comcast's DOCSIS testing can take up to six weeks is incorrect. Our DOCSIS testing typically takes from one to four weeks, depending on the number of devices being tested at any one time. For example, since June 1, 2010, Comcast has run 24 different certification waves covering 91 devices. Some devices were tested more than once due to defects found in initial testing. The "average" certification wave contained about 4 devices and the "average" test time was slightly more than 13 test days.

45. At the time when Zoom contacted Comcast about certifying its DOCSIS 3.0 modem, Comcast had not yet transitioned from the one test bed to the three test beds, so certification waves were being scheduled at the beginning of each month.

According to Zoom, it received its CableLabs certification on Wednesday, February 23, 2010. The next scheduled test wave would have begun six days later on March 1, 2010. Although Zoom criticizes Comcast for not being able to accommodate it on six days notice, Zoom admits that it is unclear whether it would have been ready to submit a device to Comcast by March 1.

46. The next available certification wave to test Zoom's modem began on April 1, 2010. There was no "hold" on testing Zoom's modem. The scheduling of the Zoom device into the April certification wave followed the same process for every other device scheduled for that certification wave. Devices that were also scheduled in the April test wave included both leased devices (e.g., [[

]]) and retail devices (e.g., [[

]]) being tested for the first time or retested in light of maintenance updates or other changes.

VI. Comcast's DOCSIS Testing Successfully Identified Issues with Zoom's DOCSIS 3.0 Modem, Which Resulted in Improvements to the Device.

47. In testing Zoom's DOCSIS 3.0 modem, [[

]] First, as Zoom notes in its Complaint, [[

]] In addition, [[

]] Finally, [[

]]

48. With respect to [[ ]], as noted above, it is critical that the customer's device register with the network in a timely fashion. Failing to do so could result in a customer being unable to make an emergency call if the customer was

using the DOCSIS device as part of a third-party Voice over IP voice service. Comcast chooses to take steps to mitigate the possibility that such a problem would occur.

49. Zoom's contention that this testing is unnecessary because a modem is likely to stay connected to the network for months or even years is incorrect. For example, as anyone who has broadband Internet service in an area that suffers power outages knows, modems disconnect each time the power goes out. Comcast's experience is that a typical modem stays connected to the network an average of about 30 days.

50. With respect to [[ ]], this is not something that Comcast's DOCSIS testing looks for, but in testing the Zoom modem our engineers noticed that [[

]] However, it's worth noting that, [[

]]

These are precisely the types of [[ ]] issues that would have been identified in the P&E testing had Zoom's DOCSIS 3.0 modem been subjected to it.

51. With respect to [[

]].

52. Although Zoom's modem [[

]] DOCSIS testing for Zoom's modem in May took only 24 days before it was sent out for field tests.

53. Zoom later praised Comcast for its testing and thanked it for identifying issues with Zoom's modem that led Zoom to develop an improved product.

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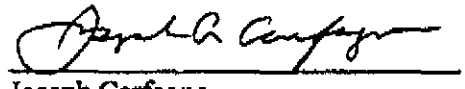
I declare under penalty of perjury that the foregoing is true and correct. Executed on this 20th day of December, 2010.



Joseph Carfagno
Director, QA Voice and Data Services
Comcast Cable Communications, LLC

EXHIBIT 2

CableLabs®

Cable Television Laboratories, Inc.

December 16, 2010

Mr. Jason Livingood
Comcast Corporation
One Comcast Center
1701 John F. Kennedy Boulevard
Philadelphia, PA 19103

Re: CableLabs Testing and Certification Program

Dear Jason:

This letter addresses statements made in the FCC complaint filed by Zoom Telephonics, Inc. ("Zoom") on November 29, 2010 regarding CableLabs' testing and certification of DOCSIS® modems. CableLabs conducts device testing and certification for the cable industry to ensure devices conform to CableLabs' specifications. DOCSIS modems and other devices that pass CableLabs' Certification testing ("CableLabs Certified" devices) are certified as being built to CableLabs' specifications. CableLabs Certified devices are interoperable with each other and, therefore, consumers and cable operators are not tied to one device provider for broadband Internet, digital voice, or interactive set-top box devices. This has resulted in a more competitive environment for cable equipment manufacturers that has significantly lowered the cost of rolling out broadband Internet and video services throughout the United States and, since CableLabs' specifications often become international standards, the world.

CableLabs' testing of DOCSIS modems -- like its testing of other cable devices -- is provided for manufacturers of cable equipment worldwide, so CableLabs' focus is on the common denominators across all operators to ensure basic functionality. As you are aware, not all DOCSIS networks are alike and network requirements and equipment vary among operators, as well as within a particular operator's network. CableLabs' cable modem testing, therefore, is for conformance to CableLabs' DOCSIS specification and basic performance issues, such as the ability for a device to power on, to communicate with the network, to send the appropriate radio frequency signals, and to interoperate with modem-connected devices in the home. A device that has passed CableLabs' testing but is later modified must be retested to retain its CableLabs Certified status. Even apparently insignificant changes, such as moving an output connector or using a component from a different manufacturer, can adversely affect device functionality.

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Since DOCSIS equipment requirements differ among cable operators, CableLabs only performs the specification-related testing for DOCSIS modems and leaves the operator-specific-related testing to the operators. CableLabs develops these objective, verifiable tests directly from the DOCSIS specifications. CableLabs tests DOCSIS modems and other devices for compliance with CableLabs' specifications in a lab setting and does not test for any physical or environmental variables.

CableLabs' testing standards evolve based on operators' experiences deploying CableLabs Certified devices. Experienced cable engineers from different cable operators, well versed in the differences of individual networks and the CableLabs specifications, review data in a live CableLabs' presentation of test results and provide CableLabs feedback as to compliance specifications for a device to be CableLabs Certified. In addition, CableLabs has implemented an Engineering Change Request ("ECR") process whereby cable operators, vendors, and other stakeholders can submit proposed changes to our specifications based on their real-world experiences. This input from industry experts and stakeholders is critical to CableLabs' testing, as testing is an iterative process. This feedback about different and changing network and device requirements helps ensure a basic level of interoperability between CableLabs Certified modems and other DOCSIS equipment deployed across the cable industry.

CableLabs' expertise lies in its own specifications. CableLabs' testing does not go beyond ensuring device conformance with these specifications. As a result, in addition to the requirements addressed in CableLabs' testing, other organizations need to conduct testing based upon their own expertise and network requirements and experience in addressing consumer issues. Just as the FCC conducts testing for compliance with Part 15 requirements and Underwriter Laboratories conducts testing as to certain safety requirements, operators must conduct additional testing in order to ensure that DOCSIS modems will function and perform reliably and safely for their subscribers.

While the testing performed by CableLabs, individual operators, and others takes time, the benefits are demonstrated daily. Thorough testing limits problems with the safety, security, and reliability of DOCSIS modems and devices, notwithstanding the many different types of devices running on different networks 24 hours a day, seven days a week. The safety, security, and reliability of DOCSIS modems and devices are important to both subscribers and the operators, who are the one most likely to receive subscriber calls in the event a device malfunctions or causes injury.

Further information regarding the CableLabs' testing and certification process is publicly available at:
http://www.cablelabs.com/cablemodem/downloads/DOCSISCertWaveGuidelines.pdf

Best regards,

Cable Television Laboratories, Inc.

By: _____
Lee Zieroth, Senior Vice President and General Counsel

/LWZ

EXHIBIT 3

EXHIBIT CONFIDENTIAL
NOT FOR PUBLIC INSPECTION

EXHIBIT 4

EXHIBIT CONFIDENTIAL
NOT FOR PUBLIC INSPECTION

EXHIBIT 5